*In the claims:*

1. (Currently Amended) A method of compensating, in the electrical domain, for chromatic dispersion of an amplitude modulated optical double sideband signal, comprising the steps of:

a) converting said amplitude modulated optical double sideband signal to an electrical signal;

b) amplifying parts of the spectrum of said electrical signal by a factor derived from its frequency; and

c) selectively inverting the phase of regions of said spectrum to thereby allow recovery of the transmitted data.

2. (Previously Presented) A method as defined in claim 1, wherein said step of amplifying and selectively inverting is described by a transfer function represented by

$$\sec\left[\pi DL\frac{\lambda_0^2}{c}f^2\right]$$

where

D is the dispersion

L is the length of the fiber

$\lambda_0$ is the wavelength of the light source

c is the speed of light

f is the frequency of the Fourier component.

3. (Previously Presented) A method as defined in claim 2, wherein said optical signal comprises a non-infinite extinction ratio.

4. (Previously Presented) A method as defined in claim 3, further comprising the step of modifying said electrical signal by introducing a non-linear element prior to application of said transfer function.

5. (Previously Presented) A method as defined in claim 4, wherein said non-linear element provides a square root of said electrical signal.

6. (Previously Presented) A method as defined in claim 3, wherein said non-infinite extinction ratio is present in said optical signal prior to transmission.

7. (Previously Presented) A method as defined in claim 2, wherein said transfer function is implemented by means of an FIR-IIR filter.

8. (Previously Presented) A method as defined in claim 1, wherein said compensation method is implemented in software.

9. (Previously Presented) A method as defined in claim 2, wherein said transfer function is used as a diagnostic tool for measuring the chromatic dispersion characteristics of an optical channel.

10. (Currently Amended) An apparatus for compensating, in the electric domain, for chromatic dispersion of an amplitude modulated optical double sideband signal, comprising:

a) signal conversion means for converting said amplitude modulated optical double sideband signal to an electrical signal;

b) means for amplifying parts of the spectrum of said electrical signal by a factor derived from its frequency; and

c) means for selectively inverting the phase of regions of said spectrum to thereby allow recovery of the transmitted data.

11. (Previously Presented) An apparatus as defined in claim 9, wherein said means for amplifying and means for selectively inverting comprises means for applying a transfer function, wherein said transfer function being represented by

$$\sec\left[\pi DL\frac{\lambda_0^2}{c}f^2\right]$$

where

D is the dispersion

L is the length of the fiber

$\lambda_0$ is the wavelength of the light source

c is the speed of light

f is the frequency of the Fourier component.

12. (Previously Presented) An apparatus as defined in claim 10, wherein said optical signal comprises a non-infinite extinction ratio.

13. (Previously Presented) An apparatus as defined in claim 10, further comprising means for modifying said electrical signal by introducing a non-linear element prior to application of said transfer function.

14. (Previously Presented) An apparatus as defined in claim 13, wherein said non-linear element provides a square root of said electrical signal.

15. (Previously Presented) An apparatus as defined in claim 12, wherein said non-infinite extinction ratio is present in said optical signal prior to transmission.

16. (Previously Presented) An apparatus as defined in claim 10, wherein said transfer function is implemented by means of an FIR-IIR filter.

17. (Previously Presented) An apparatus as defined in claim 10, wherein said apparatus is implemented in software.

18. (Previously Presented) An apparatus as defined in claim 10, wherein said transfer function is used as a diagnostic tool for measuring the chromatic dispersion characteristics of an optical channel.